EMCSF 5.1.1
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

Reply to
Attn of: WCM-121

December 6, 2002

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Alan L. Prouty
J.R. Simplot Company
999 Main Street
One Capital Center
P.O. Box 27
Boise, Idaho 83707

Re: United States of America v. J.R. Simplot Remedial Design/Remedial Action Consent Decree (RD/RA Consent Decree), Civil Action No. 99-296-E-BLW, Superfund Groundwater Extraction System Design

Dear Mr. Prouty:

The Environmental Protection Agency (EPA) is in receipt of your correspondence dated November 5, 2002 regarding follow up to our October 16, 2002 meeting on the groundwater extraction system design. The purpose of this letter is to reiterate the groundwater extraction system design basis, establish a schedule for conducting the additional work necessary for extraction system design, and articulate our expectations for revising the 30% design submittal.

EPA received the Draft Remedial Design Report for the Groundwater Extraction System dated August 1, 2002 pursuant to the schedule contained in the Statement of Work (SOW) for the RD/RA Consent Decree. Subsequent to our review of this document, EPA, Idaho Department of Health and Welfare (IDEQ), and the Shoshone-Bannock Tribes met with you on October 16th to outline a number of deficiencies with these submittals. As your November 5, 2002 letter points out, the main issue requiring resolution is the design basis for the groundwater extraction system. Until we are in agreement regarding the design basis it is unlikely that EPA can determine if the design is adequate.

Section 10.1.1.1 of the 1998 ROD states: "The purpose of the extraction well network is: 1) to contain the migration of COCs from the phosphogypsum stack and reduce the areal extent of shallow groundwater contamination within the Plant Area in excess of MCLs [maximum contaminant levels] or RBCs [risk based concentrations], and 2) to prevent migration of COCs above MCLs or

RBCs into the off-plant area." EPA reads this source control requirement to mean hydraulic containment of **all** of the water impacted by the phosphogypsum stack exceeding MCLs or RBCs, with the extraction wells located as close to the source as possible. A system design based on these parameters should achieve the performance standards established in the ROD and restated above.

Based on the information currently available to EPA, we disagree with the statement in your November 5, 2002 letter that the extraction system, as designed, will meet the remedial action objectives and associated performance standards. For example, the system, as currently designed appears to capture less than half of the gypsum stack impacted water.

Because we disagree on whether the extraction system, as designed, will meet the remedial action objectives and associated performance standards, EPA believes a significant amount of additional field work and analysis is needed to convince us that the ROD objectives will be met. To demonstrate to us that the design will meet the ROD objectives, the revised 30% design submittal needs to address the issues raised in our October 16th meeting and summarized in attachment A to this letter.

Within the scope of the work proposed in your November 5, 2002 letter, a number of field activities are suggested along with a schedule. Details of these activities have not been adequately described. A Work Plan for this additional field work must be submitted for EPA's review and approval. EPA's approval of this work as well as a revised schedule will be dependent on whether these activities will result in a design that will meet the ROD performance standards. The Work Plan must discuss all aspects of the proposed additional work and must address, at a minimum, the issues outlined below.

1) Details of all investigative methods and proposed well construction must be provided.

2) A detailed outline of the planned analysis including any additional numerical modeling that is planned must be provided.

3) Provide justification for the location of the additional monitoring wells and a map showing the locations for the wells. The justification must include an adequately scaled map with the groundwater piezometric contours.

4) Include a monitoring program to demonstrate the performance of the extraction system.

Finally, it is important to note that Simplot has not addressed any of the groundwater monitoring issues raised in the

October 16, 2002 meeting. Once the planned investigation and analysis are complete the groundwater monitoring issues must be addressed with revision to the Groundwater Monitoring Remedial Design Report.

Simplot must submit the Work Plan within 30 days from your receipt of this correspondence. The Work Plan must include a schedule for conducting the additional work as well as a date for re-submittal of the revised 30% Groundwater Extraction Remedial Design and Groundwater Monitoring Design Report. The 30% design must be revised with the additional information you propose to collect and include a demonstration that the system is capable of achieving the ROD requirements. In addition, the revised design must address the issues in Attachment A. The Groundwater Monitoring Remedial Design Report must be revised to address the issues identified in Attachment B to this letter. We look forward to meeting with you on December 10th, 2002 to discuss this matter so that we can avoid further delay in remedy implementation.

Sincerely,

Linda Meyer

Linda Meyer
Project Manager RCRA/Superfund

cc: Roger Turner, RCRA-CERCLA Program, Shoshone-Bannock Tribes
Doug Tanner, IDEQ

bcc: Charles Ordine, ORC
Administrative Record File 5.1
Sue Skinner, Pocatello
David Croxton, ECL
Mark Masarik, IOO

ATTACHMENT A

DRAFT REMEDIAL DESIGN REPORT
GROUNDWATER EXTRACTION SYSTEM

1. The extraction system proposed in the Draft Remedial Design Report for the Groundwater Extraction System for the Simplot Plant Area (Draft RDR) is not sufficient to hydraulically control all groundwater impacted by the gypsum stack. The Record of Decision (ROD) clearly establishes hydraulic control of groundwater impacted by the gypsum stacks as one of the performance standards. The proposed extraction system must be expanded to fully meet this performance standard. The Draft RDR must be revised with sufficient data and analyses to clearly demonstrate that this performance standard will be achieved.

2. The Draft RDR (pg. 13) indicates that numerical modeling of the Simplot Plant area groundwater flow system was used to identify the candidate groundwater extraction areas. This modeling was also relied upon to assist in determining extraction rates. The numerical model used for this analysis was based on the numerical model developed during the Remedial Investigation (RI). The numerical model was not developed for the purpose of designing an extraction system capable of hydraulically controlling groundwater impacted by the gypsum stacks.

   In addition to the limitations noted in the design, other limitations of the RI modeling effort include:

   - The model layers were developed using limited hydrogeologic data. The model must be revised to accurately account for the actual structure of and likely flow paths through the bedrock underlying the gypsum stacks.

   - The model boundary condition established along the eastern boundary have not been fully evaluated.

   - No water level data within the gypsum stack area was used as target data during calibration.

   - Limited sensitivity analyses were performed to test the adequacy of the formulation of the model in gypsum stack area for purposes of capture analysis.

   - Limited particle tracking to identify likely flow paths from the gypsum stacks.

Unless these limitations can be addressed an alternative analysis demonstrating that the proposed extraction locations and rates are sufficient for controlling groundwater impacted by the gypsum stacks must be provided.

3. The proposed extraction system design does not include extraction wells immediately downgradient of the bedrock knob near monitoring well (MW) 313. The Draft DRD indicates that extraction wells are not considered practical in the area downgradient of bedrock knob for the following reasons:

- The groundwater flow rates out of the central area occupied by the bedrock knob and the observed concentrations of arsenic and other gypsum stack related constituents downgradient of the knob are much lower than the adjacent areas, particularly to east of the knob;

- Extraction wells in this area are likely to be much less effective than wells located to intercept groundwater along the major flow paths to east and west of the bedrock knob; and

- Data indicate that the Simplot production wells capture a significant portion of the affecting groundwater flowing northward from the bedrock knob.

The available data contradict the reasons cited above for not capturing groundwater downgradient of the bedrock knob. These data include the following:

- The isoconcentration maps for arsenic in the shallow zone provided in Figure 9 show arsenic concentrations are elevated significantly in the upper aquifer at MW-334 (587 ug/l in 2001). The potentiometric contours in Figure 7 show that MW-334 is directly down gradient from the end of the bedrock ridge. These potentiometric contours do not show distortion in the groundwater flow pattern in the vicinity of the bedrock knob, as would be expected if this feature represented a significant impediment to groundwater flow. Groundwater flow from the bedrock knob area appears to be having a significant impact on downgradient groundwater quality.

- The boring log for MW-334 (Appendix B of the RI) indicates that at least ten feet of saturated gravels (primarily sandy gravels) are present in the upper hydraulic zone downgradient from the bedrock knob, indicating roughly equivalent hydraulic conditions to that present in front of the lower gypsum stack where extraction wells are planned.

- The groundwater flow contours depicted in Figure 7 of the Draft RDR show no impact from the facility's productions well in this area of the upper zone, although MW-334 is located in close proximity to production well SWP-4. This is consistent with the hydrogeologic conceptual model developed for the site which indicates that the American Falls Lake Beds (AFLB) hydraulically isolates the upper hydraulic zone from the lower hydraulic zone. The facility production wells would not be able to hydraulically control shallow impacted groundwater impacted flowing from the bedrock knob area.

Based on the above considerations, control of groundwater emanating from the area of bedrock knob in the shallow hydraulic zone is required in order to meet the performance standard of hydraulically controlling groundwater impacted by the gypsum stack. Unless field data can demonstrate that groundwater flow from the bedrock knob area is not impacting groundwater quality in the shallow hydraulic zone downgradient of the bedrock knob area, the ground water extraction system must be expanded to include hydraulic control of groundwater flow in the shallow zone from the bedrock knob area.

4. Water level and groundwater quality data indicate that contaminated groundwater from beneath the gypsum stack is migrating westerly across the property boundary before flowing in a more northerly direction. The groundwater flow and groundwater quality maps provided with the Draft RDR do not depict flow direction and groundwater quality data west of the Simplot boundary so that potential migration pathways and groundwater quality impacts can be evaluated. The groundwater flow and quality maps to the area west of the facility boundary must be expanded. Hydraulic analyses must be included which clearly demonstrate that the proposed extraction system will contain any groundwater impacted the by the gypsum stacks that is flowing westerly across the property boundary, including the upgradient portions of the relict channel.

5. Additional hydraulic analysis, based on stratigraphic and hydraulic data, must be provided to demonstrate that the aggregate extraction rate of 150 gpm in the west plant area will control the migration of impacted groundwater. The current analyses relies primarily on the RI modeling effort, which is not sufficient for this purpose. The collection of additional water level data west of extraction well 401, and west of the facility boundary, must be obtained during the proposed pumping tests to support any such demonstration. This analyses should clearly discriminate between areas of observed hydraulic influence and the actual capture zone expected by the extraction system. This analyses should also clearly distinguish between the hydraulic impacts of the proposed system in the upper and lower zones in the west plant area.

6. Additional groundwater quality data must be provided to define the eastern extent of the groundwater contamination in the shallow zone. The extraction system must be expanded to the east to hydraulically control all groundwater impacted by the gypsum stack.

7. Figures indicate that a significant amount of impacted groundwater flows in the lower zone from the eastern portion of the gypsum stack. This impacted groundwater will not be captured by the proposed extraction from 410 and 411. Additional groundwater monitoring wells, msut be installed to clearly delineate the eastern extent of groundwater contamination in the lower zone impacted by the gypsum stack. Based on existing data the extraction system must be expanded to the east to hydraulically control groundwater impacted by the gypsum stack in the lower zone.

8. Little analysis has been completed regarding the control of impacted groundwater in the lower hydraulic zone beyond the preliminary modeling performed as part of the Feasibility Study (FS). The capability of the RI/FS modeling for evaluating capture from the proposed extraction system has not been assessed. The analysis which has been done does not appear to account for the reduction in pumping from the plant production wells necessary to offset the pumping from other elements of the planned extraction system. A hydraulic analysis must be included that clearly demonstrates the capability of the proposed extraction system to control groundwater impacted by the gypsum stack in the lower zone. This analysis should account for any planned reduction in pumping from the plant production wells and must include a detailed water balance within the facility (e.g., flow rate to cooling towers, east overflow pond, etc.)

9. Appendix B, Section B-4.2, provides a description of and results from the simplified modeling efforts using FLOWPATH conducted in support of preliminary model design. The revised modeling efforts must be presented with more detail and with sufficient rigor to ensure that they provide an adequate basis for the extraction system design. Specifically;

   - the assumed thickness of the aquifer system must be provided
   - an assessment of the expected drawdown in the extraction well relative to the saturated thickness of the shallow zone
   - the gradients used should be fully documented.

   When constructing a model for use in evaluating the final system, care should be taken to ensure that the wells are orientated correctly relative to the groundwater gradients observed. A sensitivity analysis of the key parameters, such as hydraulic conductivity, aquifer thickness, and groundwater gradients,

must be presented to demonstrate the capability of the system to achieve hydraulic control based on the range of conditions that might be encountered.

10. The Draft RDR indicates that "based on modeling and pilot testing results, the upper zone wells will be approximately 80 feet deep and spaced approximately 80 feet apart." While the spacing of 80 feet may be only a preliminary estimate, there is no proposed procedure to adjust spacing according to the conditions actually encountered during individual well installation. To ensure that the extraction well system meets the performance standard of hydraulic containment of groundwater impacted by the gypsum stack, testing of each well must be conducted as it is installed to compare the hydraulic conditions encountered with those in the design. If the conditions encountered differ from those in the design, a means of modifying the well spacing should be incorporated into the well installation plan.

11. When discussing system start-up and optimization, the Draft RDR provides few concrete details regarding how the extraction system will be evaluated and optimized during the initial 18-month start-up period currently anticipated. Evaluation of the currently proposed extraction system raises the significant concern over how the hydraulic effectiveness of such a system will be demonstrated within the 18 month start-up period. Normally, the hydraulic effectiveness of a groundwater extraction system is demonstrated using water level and groundwater quality measurements from nearby wells. A monitoring program has not been proposed for meeting this objective and must be included in the revised design.

12. The revised design must include a plan documenting how the system will be it optimized during the initial start-up period. This plan should include a comprehensive listing of all the data that will be collected, the methods of analyses that will be used to evaluate the effectiveness of the system based on that data, and the criteria that will be used to further adjust the system based on that analyses.

13. To assist EPA in evaluating the proposed extraction system, the following additional data and analyses should be provided:

    - Tables providing well construction details for all Simplot wells, including the depth and elevation of the bottom of well, the depth and elevation of the top and bottom of the screen, and a designation of the hydraulic zone in which the well is screened;

    - Revised potentiometric maps including water level data from FMC wells 136, 142, 143, and 146;

- East-west cross section based on hydrogeologic data from 308, 323, 306, 300, and 305;
- East-west cross section based on hydrogeologic data from borings 310/309, 313, 316, 322, and 510;
- East-west cross section based on hydrogeologic data from borings 311/312/329, 319, 335, 327, and 508;
- North-south cross section based on hydrogeologic data from borings 302, 300, 305, 328, 508; and
- Extension of Cross Section A-A' presented in Appendix A to included hdrogeologic data from boring 310 and 311
- Boring and well completion logs for all productions well installed by Simplot, regardless of their current use.

ATTACHMENT B
PREFINAL REMEDIAL DESIGN REPORT
GROUNDWATER MONITORING

1. The Prefinal Remedial Design Report for Groundwater Monitoring (RDR/GM) has identified Batiste Spring and the Spring at Batiste Road as the Points of Compliance (POCs) for meeting the performance standard in the off-site area. Monitoring at Batiste Spring and the Spring at Batiste Road is not sufficient to demonstrate compliance in the off-site area.

   An expanded monitoring program that considers all potential points of discharge (gaining reaches of the river) and the vertical distribution of contaminants must be developed to ensure that the performance standard is met in off-site area. Monitoring of well clusters installed at strategic locations along the river combined with more extensive spring monitoring that accounts for potential variability in contaminant distribution within a spring discharge will be necessary to meet the monitoring objective.

2. When identifying locations for the POC monitoring, the Prefinal RDR/GM has referenced the groundwater flow directions shown on Figure 4. The groundwater flow directions shown on Figure 4 do not agree with the flow directions indicated by the water levels shown on Figures 7 and 8 of the Draft Extraction System RDR.

   The groundwater levels and quality data appear to indicate that a more easterly migration pathway in the deeper aquifer zone exists than indicated in Figure 4 of the Prefinal RDR/GM. It is not clear if this is an actual area of discharge to the Portneuf River because is has previously been identified as an area where the river appears to transition from a losing reach to a gaining reach. Based on the flow paths indicate by the available water level data, this area will require greater evaluation and monitoring to demonstrate the performance standard is met.

3. The Prefinal RDR/GM (pg. 18)indicates that to evaluate the performance of the remediated Former East Overflow Pond, "up gradient and down gradient wells will be compared using an analysis of variance method." It also acknowledges that the pond is downgradient of the proposed extraction system and that constituent concentration are expected to recede after the extraction system becomes operational. Additional discussion analyzing the potential impacts of a full or partial gradient reversal on the evaluation of groundwater quality beneath the former pond should be presented. Contingency procedures for evaluating data under the various scenarios that may develop beneath the Former East Overflow Pond should be proposed.

4. The proprosed ANOVA statistical method is only appropriate if the data sets involved are normally distributed and their variance are approximately equal. If these conditions are not met, another statistical procedure must be used. Appendix B must be revised to include testing to verify the conditions of normality and equal variance are met. Alternative statistical procedures that can be used if these conditions not be met must also be specified.

5. The groundwater sampling procedures contained in the standard operating procedures provided in Appendix A are not consistent with the procedures described in Section 4.1 of the Prefinal RDR/GM. For example, standard operating procedure HF-SOP-11 (Sampling Monitoring Wells for Inorganic Parameters) contained in Appendix A allows purging and sampling with a bailer, while the text in Section 4.1 call for the use of variable-speed, submersible pump. No mention of the depth for the placement of pump is included in HF-SOP-11, while the text of Section 4.2 calls for the placement of the pump intake approximately 10 feet below the water table. All standard operating procedures contained in Appendix A must be revised to be consistent with procedures described in the text.

6. The procedures proposed for well purging are not consistent with low flow sampling methods. The RDR/GM must be revised to require use of low flow sampling procedures for monitoring.

7. Filtering of samples is planned if the turbidity of samples is above 10 NTUs. It is likely that the turbidity of samples can be controlled by using low flow sampling. Filtering of groundwater samples must be eliminated from the planned protocol for sampling groundwater.